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# CLAIMS

1. (Amended) A decoding apparatus for decoding a modulation code encoded in accordance with a variable-length table in which input bit lengths are variable, comprising:

code input means for inputting the modulation code; and  
decoding means for decoding the modulation code input via the code input means; wherein

the decoding means decodes the modulation code on the basis of a modulation code trellis represented by paths corresponding in a one-to-one fashion to overall state transitions in the encoding process of the modulation code in accordance with the variable-length table.

2. A decoding apparatus according to claim 1, wherein the modulation code is a 17PP (Parity Preserve/Prohibit Repeated Minimum Transition Runlength) modulation code.

3. A decoding apparatus according to claim 1, wherein the decoding means performs the decoding using a soft input.

4. A decoding apparatus according to claim 3, wherein the decoding means performs the decoding using a soft-decision Viterbi algorithm.

5. A decoding apparatus according to claim 3, wherein the decoding means performs soft output decoding.

6. A decoding apparatus according to claim 5, wherein the decoding means performs the decoding using a BCJR (Bahl-Cocke-Jelinek-Raviv) algorithm.

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7. A decoding apparatus according to claim 5, wherein the decoding means performs the decoding using a SOVA (Soft-Output Viterbi Algorithm).

8. A decoding apparatus according to claim 1, wherein the code input means inputs a PR (Partial Response)-equalized modulation code; and

the decoding means decodes the modulation code in accordance with a combined trellis obtained by combining a PR trellis and a modulation code trellis.

9. (Amended) A decoding method for decoding a modulation code encoded in accordance with a variable-length table in which input bit lengths are variable, comprising the steps of:

inputting the modulation code; and

decoding the modulation code input in the code input step, wherein

in the decoding step, the modulation code is decoded based on a modulation code trellis represented by paths corresponding in a one-to-one fashion to overall state transitions in the encoding process of the modulation code in accordance with the variable-length table.

10. (Amended) A program storage medium including a program stored therein for causing a computer to perform a decoding process on a modulation code encoded in accordance with a variable-length table in which input bit lengths are

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variable, the program comprising the steps of:

inputting the modulation code; and

decoding the modulation code input in the code input step, wherein

in the decoding step, the modulation code is decoded based on a modulation code trellis represented by paths corresponding in a one-to-one fashion to overall state transitions in the encoding process of the modulation code in accordance with the variable-length table.

11. (Amended) A program for causing a computer to perform a decoding process on a modulation code encoded in accordance with a variable-length table in which input bit lengths are variable, comprising the steps of:

inputting the modulation code; and

decoding the modulation code input in the code input step, wherein

in the decoding step, the modulation code is decoded based on a modulation code trellis represented by paths corresponding in a one-to-one fashion to overall state transitions in the encoding process of the modulation code in accordance with the variable-length table.